

# 7 ECOSYSTEM SERVICES AND PROTECTED AREAS

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Local protected areas are an important resource for policy makers and can be a benefit, not a burden to local populations. By considering the ecosystem services they provide, local policy makers can identify these benefits, and provide motivation for the establishment of protected areas (PA) beyond conservation – that of enhancing local human well-being.

This chapter examines why PAs are important to local policy, in addition to being important to conservationists (7.1). It looks at different options for local policy makers to become involved in PAs (7.2). Finally, it explores how looking at ecosystem services can help in various ways to face the challenges of PA management (7.3).

## Key Messages

- **Protect your assets.** Protected areas (PA) can be an important asset to local government. They secure ecosystem services, can create jobs and bolster a community's reputation. To enhance local benefits, protected areas need to be integrated in the management of the surrounding landscape.
- **Get to know your neighbors.** Where PAs are primarily aimed at national/international conservation objectives rather than local ones, cooperation between local authorities and PA administration harmonizes action. This helps lower costs, both for PAs and neighboring municipalities.
- **Tailor-made fits better.** There are different solutions for different challenges in and around protected areas. Get involved. Local policy makers can (i) collaborate or co-manage with park authorities; (ii) set up and run municipal PAs; or (iii) support indigenous and local communities to manage their own areas.
- **Discover the benefits.** A focus on ecosystem services uncovers the benefits beyond protecting species. This can help secure higher level backing and inform zoning and management. It also helps create partnerships and raise conservation funds.
- **A way to deal with conflicts.** Local authorities are intermediaries between actors with diverse social and economic interests. They can use an ecosystem services perspective to understand how costs and benefits of conservation are distributed. This helps address conflicts related to PAs.

## 7.1 WHY ARE PROTECTED AREAS IMPORTANT IN LOCAL POLICY?

Protected areas are a flexible →*management* tool aimed primarily at achieving nature conservation; they also provide **a range of associated economic, social, cultural and spiritual benefits**. Protected areas cover 11.9% of the terrestrial and coastal waters of the world excluding Antarctica (UNEP-WCMC 2010); most countries have PAs with associated policies, legislation and staff and their benefits are widely appreciated. Many local authorities have PAs managed by other agencies within their jurisdiction but retain some responsibility for these places; in addition, local governments are increasingly setting up PAs themselves, to meet regional conservation objectives and to provide →*ecosystem services*; some also see them as sources of revenue.

**PAs also create challenges for local policy makers.** While there is widespread agreement that it is important to protect these areas, tensions arise over policies that restrict access to natural →*resources* for local communities. The social and economic cost

of maintaining PAs has caused local conflicts around the world (Dowie 2009).

Although most PAs are not managed by local authorities in a legal sense, they are de facto important areas for local policy makers because they can have significant positive and negative effects on local communities. In many situations, **the way in which a PA is implemented determines whether it is a problem or an asset** for local development. Implementation comprises issues such as coordination with the surrounding lands, the rules in use and the organisation of management. A focus on ecosystem services and an interest in how PAs are implemented and managed helps policy makers to **assess whether local benefits can be enhanced** – or the costs to local communities can be lowered.

**Conservation and local development efforts need to be coordinated.** Taking a long-term perspective, we see that these objectives are often aligned,

### Box 7.1 Reasons for policy makers to consider PAs in local development

- PAs are connected to surrounding land, water, and local communities. They are part of a larger social and ecological landscape.
- Coordinating regulation and management inside and outside PAs can decrease conservation-related costs and increase conservation-related benefits.
- Good coordination can enhance and secure the flow of ecosystem services to local beneficiaries.
- Conservation and local development face common challenges; a growing demand on natural resources, funding shortages, and contradicting sector policies. Coordinating efforts can be mutually beneficial.
- If local authorities establish and (co-)manage their own PAs, they have more control over community resources and objectives.
- Many local communities and indigenous peoples want PAs so they can conserve their landscape, livelihoods, collective rights and culture.

because maintaining →*natural capital* is essential to the well-being of a community. In turn, PAs flourish best if they are embedded in a healthy landscape or seascape in which the welfare of all →*stakeholders* is considered.

### CONNECTED WITH SURROUNDING LAND AND SEASCAPES

Protected areas do not exist in isolation but interact constantly with their surroundings. When establishing or dealing with a PA, policy makers should consider what ‘passes through’ it. For example, is it located on a watershed (like the Danube Delta reserve in Romania)? Is it located on a migratory corridor (as in

Kitengela, Kenya)? Are the animals that use it reliant on a wider landscape for survival (such as grizzly bears in Yellowstone National Park, USA)? Secondly, it is important to consider what **benefits the PA can supply beyond its own border** in terms of ecosystem services, for example:

- About a third of the planet’s largest cities receive a significant proportion of their drinking water from watersheds inside protected areas (Dudley and Stolton 2003).
- The Tubbataha Reef National Marine Park in the Philippines restricted unsustainable fishing practices, leading to a doubling of fish biomass (Dygico 2006) (See also TEEBcase Temporary closures in octopus reserve increase catch, Madagascar).



### Box 7.2 What are protected areas?

The International Union for Conservation of Nature (IUCN) defines PAs as “a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural →*values*” ([www.iucn.org/about/work/programmes/pa/pa\\_what](http://www.iucn.org/about/work/programmes/pa/pa_what)). The Convention on Biological Diversity (CBD) says it is “a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives”. It is recognized that both definitions convey the same general message (Dudley 2008).

PAs vary enormously in management and →*governance*. Management models range from strict, exclusionary protection to protected landscapes and seascapes that include farmland, forestry and settled areas. PAs are governed and managed by national, regional or local authorities, trusts, indigenous peoples, local communities and private individuals, often in collaboration with each other (Borrini-Feyerabend et al. 2004).

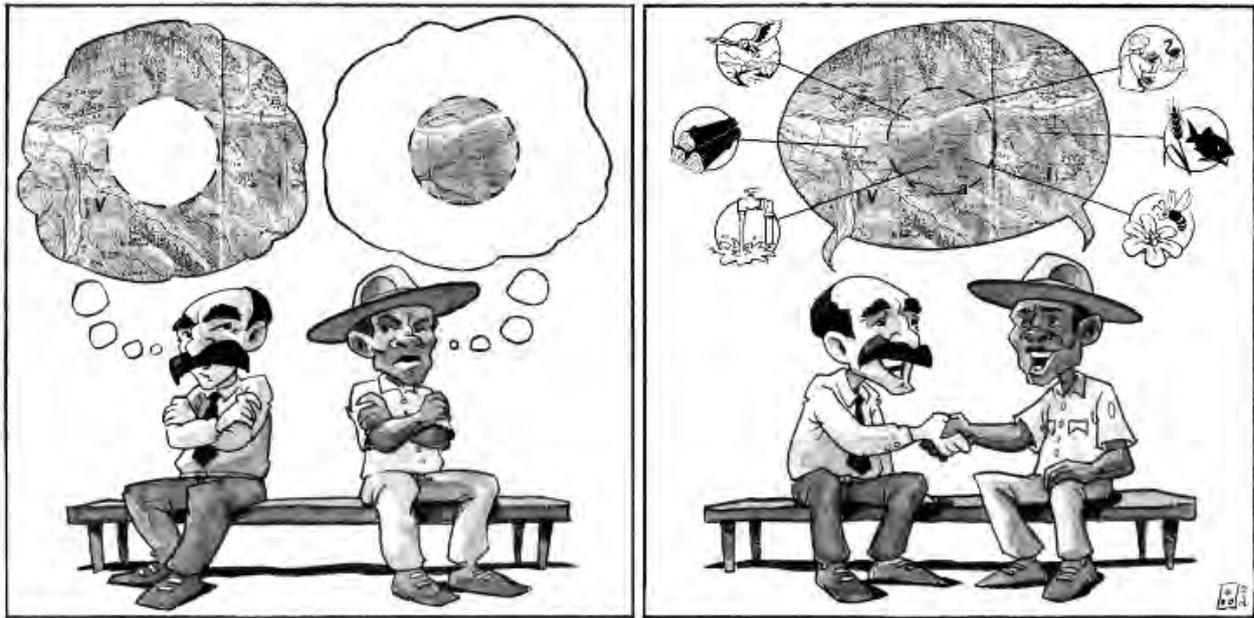


Illustration by Jan Sasse for TEEB

Looking at ecosystem services helps local authorities and conservation managers to see the interdependency between a protected area and surrounding land

The development and **activity on adjacent lands influences the protected area**, particularly when it exists as fragmented ‘island’ of intact nature in an otherwise transformed landscape. For example, wind and water can transport fertilizers, pesticides and toxins. In turn, local communities can have a positive impact on PAs because often **traditional land-use practices** maintain → *biodiversity*:

- In Serbia, extensive livestock production with indigenous sheep, goats and cattle maintains mountain meadow → *ecosystems* of the Stara Planina Nature Park (Ivanov 2008).

However, **human-wildlife conflict** also occurs near many PAs, where wildlife density is high and animals stray into adjacent fields or grazing areas:

- In China, people living in close proximity to Xishuang Banna Nature Reserve, claim that Asian elephants cause crop and property damage that account for 28-48% of their annual income (Zhang and Wang 2003).

While some of these concerns are beyond the scope of local policy, **local authorities often make choices that impact protected areas through planning, regulation, agricultural extension and public investment**. Local authorities have the opportunity and obligation to ensure that PA management represents as fully as possible the needs of local stakeholders. The Ecosystem Approach (see Chapter 2) comprises an internationally endorsed set of principles for an → *integrated management* of different land uses.

### Box 7.3 Ecological corridors: A tool for connecting PAs with surrounding landscapes

‘**Ecological Corridors**’ connect PAs with adjacent areas in a coordinated management regime so migrating animals and ecological processes fare better even if land-use in neighboring land intensifies.

The Oak Forest Corridor in Colombia’s Eastern Mountain Range, includes 67 municipalities in an area of ~1 million ha. The corridor comprises oak forest and moorland in a region where less than 10% of the original Andean forest remains. Inside the corridor, municipalities incorporated the unique characteristics of the forest into their development plans and collaborated with environmental organizations in sustainable production projects (Solano 2008).

Source: [www.corredordeconservacion.org](http://www.corredordeconservacion.org)

## SHARING THE COSTS AND BENEFITS OF CONSERVATION

Communities adjacent to PAs benefit directly from the services flowing from them. At the same time, many also bear the costs of restricted access to local resources. While most people support the existence of PAs, those in close proximity may have a more ambivalent view, especially if the implementation of PAs translates into loss of land-use rights, missed development opportunities and reduced access to life-supporting services. **A major challenge for managers is to balance the long-term, 'global' benefits of a protected area with the immediate needs of a local community.** In particular, women's livelihoods often depend on the collection of wild natural products inside protected areas.

- **Nagarhole National Park** in India has around 10,000 people living inside. A study on a sample of these tribal settlements found that they relied on non-timber forest products (eg wild food, gum, fibres, medicinal plants) for an average of 28% of their total household income, reaching almost 50% in some areas (Ninan 2007).
- In **Caprivi Game Park**, Namibia, sustainable harvesting techniques of palms enabled local women to supplement household incomes by selling woven palm baskets to tourists. Producers grew from 70 in the 1980s to more than 650 by the end of 2001, providing one of the few sources of income for women (WRI 2005).

Protected areas often limit certain ecosystem services, such as crop production, in order to enhance wildlife habitat and a range of regulating services, such as erosion control. While this makes sense for the wider landscape, it may have negative implications at the local level. Therefore, those who experience

restrictions need alternative subsistence solutions – or sufficient monetary compensation. **Local governments and NGOs can seek to facilitate agreements between stakeholders; their knowledge of local costs and their links to higher policy levels allows them to make agreements with distant stakeholders that can benefit local ones.**

- The Banc d'Arguin National Park in Mauretania has helped secure rich fishing grounds off the coast. European fishing companies have so far captured most of the benefits, based on European payments to the national government of Mauretania. In 2006 a new fisheries partnership protocol with the European Commission specified that annually €1 million of the financial contribution should directly serve to support the management of the park (EC 2006). Management activities are geared to marine conservation and sustainable coastal development. Lobbying from local government and NGOs were instrumental in this arrangement.

Many PAs attract tourists. This is usually considered to benefit the local community because it generates revenue. However, in some cases, conservation-related tourism rapidly changes local lifestyles and can generate largely private, unevenly distributed, benefits within communities. Policy makers can intervene by pushing for appropriate regulations. **If PAs are well-managed, both small-scale tourism and externally managed high-end tourism can benefit local stakeholders.** For example, Point Pelee National Park in Canada annually attracts over 200,000 visitors and birdwatchers (Parks Canada 2007), who bring millions of dollars of additional revenue into the local area every year (Hvenegaard et al. 1989). **Policy makers can invite capacity and market development from outside investors, but should take care about not losing options for adapting tourism to local needs** (see Chapter 5).

### Box 7.4 An economic success story of developing tourism within ecological limits

The small tropical island of **Fernando de Noronha** (Brazil), a former naval base with beautiful beaches, was declared a national park in 1988. The island government ruled that the number of tourists on the island should be kept within a limit so as to maintain the island's ecological and socio-economic balance. Furthermore, only people permanently living on the island were allowed to provide tourism services. In consequence, most of the ~3000 inhabitants have a stable income from tourism, for example, more than 100 families developed small family hotels on the island.

Source: MMA 2001; IBAMA et al. 2005



**A thorough understanding of costs and benefits associated with PAs can be achieved by a close examination of the flows of ecosystem services.**

A clear picture of the economic benefits available at a local level can help people understand the role of PAs in their livelihoods. This can help ensure that benefits are shared equitably and in some cases can aid in the development of realistic compensation mechanisms for people who have exchanged their immediate concerns for the 'greater good'.



In addition, such understanding is key to deciding which areas will be protected and how to manage

them. Policy makers should consider local dependence on PAs for food, fibre and cash income because these factors contribute to access-related conflicts.

Ideally, people in buffer and transition zones should have secure incomes from eco-friendly resource-use to support PA conservation. As seen in the case of Namibia, **communities benefit if local authorities promote tourism-related private businesses** such as accommodation, souvenir shops and wildlife viewing tours. Keep in mind, however, that while these businesses can play a key role, well-targeted government or private financial support mechanisms may

**Table 7.1 Costs and benefits of PAs in Namibia at local, national and global levels**

Currently PAs cover 17% of Namibia's national territory. Annually 540,000 visitors come to the country for their holidays. Namibia's 400 private hunting farms and conservancies on communal land cover 14% of the territory (2004). The national benefit from tourism (US\$ 335.6 million) is far higher than the management costs (US\$ 39.4 million). However, the number of local tourism-related jobs within or near a PA is low. This table shows costs and benefits at different policy levels and provides data where available:

	Costs	Benefits
<b>Global</b>	<ul style="list-style-type: none"> <li>- approximately <b>US\$ 8 million</b> International transfers for PA management</li> </ul> <p><b>Costs carried by:</b></p> <ul style="list-style-type: none"> <li>- International donors</li> </ul>	<ul style="list-style-type: none"> <li>- Option/→<i>existence value</i> of biodiversity</li> <li>- International tourism</li> </ul> <p><b>Beneficiaries:</b></p> <ul style="list-style-type: none"> <li>- Global community</li> <li>- Foreign tourists, tour operators, airlines, etc.</li> </ul>
<b>National</b>	<ul style="list-style-type: none"> <li>- US\$ 18.6 million spent on management</li> <li>- US\$ 20.8 million spent on operational costs of tourism facilities</li> </ul> <p><b>Costs carried by:</b></p> <ul style="list-style-type: none"> <li>- Ministry of Environment and Tourism</li> <li>- Directorate of Parks &amp; Wildlife Management</li> </ul>	<ul style="list-style-type: none"> <li>- Habitat value &amp; cultural value (not quantified)</li> <li>- Water provision (minimal)</li> <li>- Tourism-related jobs (about 20,000 people)</li> <li>- Over 2,200 tourism-related businesses</li> </ul> <p><b>Beneficiaries:</b></p> <ul style="list-style-type: none"> <li>- Households (rural 16%, urban 20%)</li> <li>- Private enterprises (39%)</li> <li>- Government (20% in taxes)</li> </ul>
<b>Local</b>	<ul style="list-style-type: none"> <li>- Foregone income from agriculture (low)</li> <li>- Crop damage, livestock losses and damage to infrastructure due to wild animals (figure not known)</li> </ul> <p><b>Costs carried by:</b></p> <ul style="list-style-type: none"> <li>- Local communities</li> </ul>	<ul style="list-style-type: none"> <li>- Employment in PAs (1,100 people)</li> <li>- Accommodation near PAs (US\$ 51.4 million); tour operators/guides (US\$ 13 million)</li> <li>- Revenue from tourism inside PAs (US\$ 12.9 million – min. 4% of PA revenue for local communities)</li> </ul> <p><b>Beneficiaries:</b></p> <ul style="list-style-type: none"> <li>- PA management, government</li> <li>- Private business in rural areas</li> <li>- Local communities</li> </ul>

Source: adapted from Turpie et al. 2009

also prove necessary (see Chapters 8 and 9). In order to develop sound policies, local authorities, civic

organizations and local businesses have to collaborate – and local governments play a key role in this arena.

## 7.2 GETTING INVOLVED IN LOCAL CONSERVATION MANAGEMENT

Designating an area as protected does not guarantee its security. Many are under immediate or future threat – from illegal practices, legal challenges, changing national policies and climate change (Carey et al. 2000).

Strong local involvement is key to protected area success. Conservation must build on local expertise and support in order to conserve biodiversity without harming local livelihoods. There is no blueprint for implementation, but at least three options exist for local government and stakeholders to become involved:

1. Engage in co-management arrangements;
2. Set up a municipal PA;
3. Support community conserved areas.

### CO-MANAGEMENT WITH PA AUTHORITIES

Many PAs are owned or managed by national government, charitable trusts, communities or private individuals. **Local involvement can extend to a co-management role, even if overall control remains elsewhere.** Local governments, sector agencies and park authorities can harmonise their actions and joint-management committees or inter-agency working groups can meet regularly to discuss issues.

In the mid-term, the benefits of exchanging expertise and establishing a common agenda outweigh the obstacles of bringing stakeholders with different interests to the same table. In fact, some conservation approaches, such as the UNESCO biosphere reserve concept, explicitly foresee the collaboration of local organizations and various government agencies in developing models for sustainable local resource-use in buffer zones ([www.unesco.org/mab](http://www.unesco.org/mab)).

### MUNICIPAL PROTECTED AREAS

Today, local governments themselves designate and manage an increasing number of PAs to meet regional conservation objectives and enhance the flow of ecosystem services to local beneficiaries. For example, in the metropolitan areas of Sao Paulo (Brazil), Toronto (Canada) and Beijing (China), municipal authorities have created ‘greenbelts’, a combination of public parks, green spaces, and PAs with restricted access and specific rules for private land (see Chapter 4). Greenbelts are intended to improve citizens’ quality of life, and influence the dynamics of urban sprawl; they secure important ecosystem services such as the regulation of air temperature and the provision of natural flood control in urban areas. This concept has also been taken up by small municipalities



#### Box 7.5 Key features of successful co-management

- Co-management brings together a diversity of people, with distinct strengths, from different institutions. Actors bring their own knowledge, interests, and views to the table. For this reason, **skilled facilitation is essential.**
- Co-management involves negotiation, joint decision making and power sharing. Responsibilities, benefits and management resources are shared. **Each participant expects to have influence and benefit from their involvement.**
- Co-management is a flexible process. It requires on-going review and improvement rather than a fixed set of rules. **The success of co-management depends on partnerships.**

Source: adapted from Borrini-Feyerabend et al. 2004

### Box 7.6 Collaboration in the Dyfi Biosphere Reserve in Wales, UK

Proposals for the Dyfi Biosphere Reserve were coordinated by EcoDyfi, a local NGO with representation from local councils, farmers' organizations, the tourism industry and environmental and social NGOs. Its mandate is to promote environmentally sustainable developments within a watershed and it already had a history of several years working in the community and consequent support from a wide range of key stakeholder groups. EcoDyfi worked with the government-run conservation body, the Countryside Council for Wales, to develop plans for the reserve.

Source: [www.dyfibiosphere.org.uk](http://www.dyfibiosphere.org.uk)

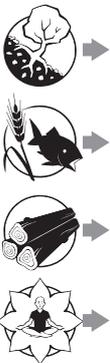
### Box 7.7 Protecting biodiversity in Cape Town: Multiple agencies and objectives

Some of the richest biodiversity in Southern Africa is within the city limits of Cape Town: Table Mountain National Park, 22 municipal PAs and several natural reserves serve to protect this natural heritage. They are managed by national and local authorities. A city-wide biodiversity strategy guides inter-agency collaboration. While the National Park is a key attraction for Cape Town's tourism industry, PAs in poorer neighborhoods are used for community development. They facilitate education and social work with youth by allowing people to reconnect with nature (Trzyzna 2007).



with the same objectives. In the Brazilian city of Alta Floresta (population < 50,000), a greenbelt is being developed connecting forest on public land inside the urban area with private property (Irene Duarte, pers. comm. 2010).

By making small changes to regulations, local governments can enhance local benefits from PAs. For example, in Keoladeo National Park near the city of Bharatpur (India), park fees are waived for people who exercise between 5-7 am. In the heat of summer, up to one thousand 'morning walkers' take advantage of this opportunity every day (Mathur 2010).



### INDIGENOUS AND COMMUNITY-BASED CONSERVATION

Some areas and their associated economic and cultural values have been conserved through the decisions and actions of indigenous peoples and/or other local communities. These areas are known as **indigenous peoples' protected areas, indigenous peoples' conserved territories or community**

**conserved areas.** Local governments and stakeholders can support the efforts of local communities to maintain or establish indigenous or community conserved areas (ICCAs).

Community-based conservation is suitable for protecting areas where collective needs, such as protection against erosion, outweigh private needs. This kind of conservation is likely to be most successful in areas **where people's livelihoods depend on the responsible use and collective management of jointly owned resources** like fishing areas, grazing grounds or forests, or where the site has important cultural and spiritual values. **Here, conservation consists of place-specific land-use practices** that local inhabitants have developed, often over generations.

A common feature of ICCAs is stakeholders' concern for ecosystem services because their quality of life and livelihoods often directly depend on them, encouraging them to create regulations and protection measures that effectively protect key areas of

### Box 7.8 Indigenous and community conserved area (ICCA)

ICCAs are natural and/or modified ecosystems containing significant biodiversity values, ecological services and cultural values, voluntarily conserved by Indigenous peoples and local communities, both sedentary and mobile, through customary laws or other effective means.

Source: [www.iccaforum.org](http://www.iccaforum.org)

**Box 7.9 Pastoralists of the Chartang – Kushkizar Wetland, Iran**

Since time-immemorial, the stewardship of the Chartang-Kushkizar wetland has been shared between the Kuhi and the Kolahli sub-tribes of the Qashqai nomadic pastoralists of southern Iran. It is a crucial stopping point in the Kuhi's yearly migration between wintering and summering grounds and provides many ecosystem benefits – water, reeds for handicrafts, medicinal plants, fish and wildlife.

Recently, the government earmarked part of the area for agricultural use. In response, the Council for Sustainable Livelihoods of the Kuhi Migratory Pastoralists have petitioned and proposed to government authorities that the wetland and surrounding rangelands become an ICCA regulated by community elders. At present, the petition is under review and has received some support from government. Major agricultural use of wetland water has been stopped.

*Source: adapted from Borrini-Feyerabend et al. 2008*

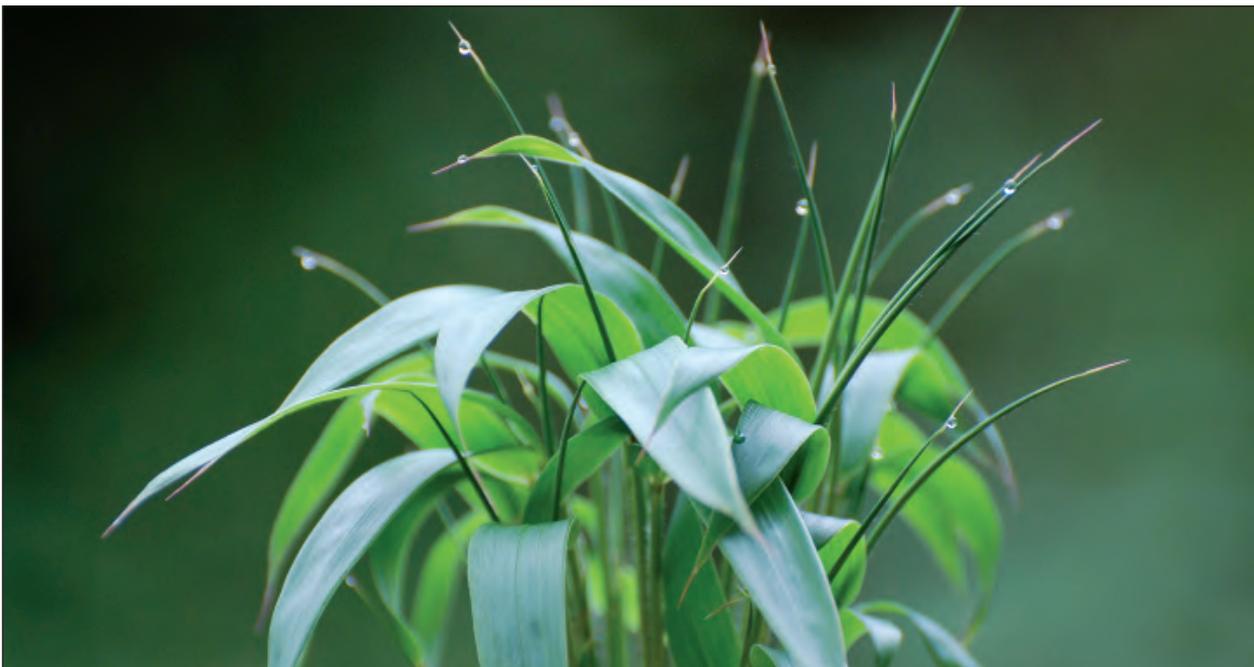


an ecosystem. Conservation is here **a communal effort with its own set of use rules**, eg for harvesting forest products (Hayes 2006). Members adopt and are expected to respect land and water related regulations and communities agree on sanctions for people who breach rules. **Substantial political autonomy, stable economic conditions, land tenure security and a culture of trust and collective concern are usually critical for the success of ICCAs** (Becker 2003).

Policy makers should keep in mind, however, that **different objectives and perceptions** of what constitutes successful community-based conservation makes **external support a delicate affair**. Financial

support for ICCAs can have destructive effects on a community's collective capacity – influencing and altering a community's motivations (Axford et al. 2008). Also, rural societies are subject to political and economic change, and not all indigenous and local communities equally maintain appropriate ecological knowledge (Atran 2002).

That said, local governments have a role to play in supporting ICCAs, which need to be identified and assisted at a local scale. **Policy makers can play a key role** in recognizing their legitimacy, communicating their self-identified needs and supporting them **in negotiating with national government, donors and PA agencies**.



Copyright: Nigel Dudley

Tropical leaves in the Ecuadorian cloud forest ensure water capture

### Box 7.10 The Shuar Protected Territory, Ecuador

In 1998, the government of Ecuador recognized constitutional collective rights for the 10,000 Shuar Arutam people and their territory of 200,000 ha. In 2004, an Assembly of Shuar members decided to create the Shuar Protected Territory (SPT). The SPT is not part of the National Protected Areas regime, it is an autonomous territory governed by the Shuar people with a local indigenous government that sustainably manages forests. The main objective of the SPT is to guarantee the survival and development of the Shuar culture as well as the conservation of their land.

Shuar community participation has been key to the implementation of an effective conservation strategy: only 8.8% of the forests in the SPT have been deforested. The SPT has allowed the Shuar people to clearly limit their territory, create a legitimized authority, and determine the rules and vision of their development model under the principles of autonomous governance based on Shuar tradition.

Source: Kingman 2007; UNDP 2010

## 7.3 REASONS FOR ASSESSING ECOSYSTEM SERVICES OF PROTECTED AREAS

A focus on ecosystem services helps local and conservation authorities:

1. Build political support for conservation.
2. Make informed planning and management decisions.
3. Address conservation conflicts.
4. Build alliances.
5. Raise funds for conservation.



### BUILDING POLITICAL SUPPORT FOR CONSERVATION

Protected areas are best understood as far-reaching protection of the natural capital of a region – the →assets upon which →human well-being and economic development are built.

Stakeholders often are not aware that **environmental stewardship is in their economic interest**. In fact, the return on investment in PAs is often high. On a global scale, it has been estimated that every dollar invested in PAs produces close to US\$ 100 in ecosystem services (Balmford et al. 2002). Although such figures are necessarily highly approximate, they give an impression of the magnitude of the return for investing in, and successfully managing, these areas (see also TEEB in National Policy, Chapter 8).

There is evidence that PAs are economically beneficial. Lake Chilwa (Malawi), for example, is a protected wetland of international importance. It has an annual fish catch worth US\$ 18 million and produces more than 20% of all fish caught in Malawi (Schuyt 2005; Njaya 2009). Leuser National Park in Indonesia was estimated to be capable of generating US\$ 9.5 billion →total economic value (TEV) between 2000-2030 from a range of ecosystem services, if under effective conservation management (Van Beukering et al. 2003).

If local policy makers focus on ecosystem services, the economic importance of a protected area becomes clear. This knowledge can help local authorities effectively garner support for conservation, especially when conflict is exacerbated by outsider interests in natural resources – like logging, mining or industrial fishing.

To gain support at the regional level, local policy makers should ask: Which regional benefits will we miss out on if we do not start caring for this area now? This can also work for less tangible benefits, such as the appreciation of wolves as a charismatic species. (TEEBcase Local value of wolves beyond a protected area, USA)

### Box 7.11 Flood regulation: Political support for a protected wetland in New Zealand

The Whangamarino wetland is a highly biodiverse peatland in New Zealand. It is home to many rare plant communities, 60% of which are indigenous. Several are endangered, rare or vulnerable.

The case for protecting the wetland was furthered by highlighting its role in flood control and sediment trapping. Its annual benefits are estimated at US\$ 601,037 (2003). In flood years, this estimate is much higher – US\$ 4 million in 1998. The Department of Conservation concluded in 2007, “If Whangamarino wetland didn’t exist, the regional council would be faced with constructing stopbanks along the lower course of the river at a cost of many millions of dollars.”

Source: Department of Conservation 2007



## MAKING INFORMED PLANNING AND MANAGEMENT DECISIONS

Policy makers are faced with many questions when designating a PA. Where should it be, and what size? What restrictions should it have? How should it be managed? What activities should be permitted? How will communities be affected? **Asking the right questions is crucial to effectively creating and managing a PA.**

Assessment of ecosystem services can help to decide where to locate protected areas, their size, shape, management model etc. Total evaluation studies for a range of alternative management models can compare and balance different options within regional planning processes. In general, an **ecosystem services assessment** connects ecological knowledge (how big does the area need to be for an ecosystem to function properly?) with economic and political concerns (how will the PA alter the community’s economic and social prospects?). For example, if policy makers are considering instituting an antelope hunting ban, this assessment model **can help them get a clear picture of all the relevant issues** – such as, how will the ban affect the larger ecosystem? The antelope population?

Peoples’ meat demands? Tourism income? If carried out well, and in a participatory manner, an ecosystem services assessment provides a holistic view of a community’s concerns and enables a healthy, participatory, decision-making process.

There are different kinds of exercises for assessing the make-up and distribution of ecosystem services (See Pabon-Zamora in ‘for further information’ section). For example:

- A **Cost-Benefit Analysis** can determine which PA regulations have the potential for the most balanced distribution of ecosystem benefits to stakeholders.
- Using participatory planning methods, stakeholders can **assign different ‘weightings’ to different ecosystem services** to be considered in the overall decision.
- Policy makers can **evaluate a PA’s potential to generate revenue** under effective management.

Such exercises are especially productive if the PA is considered within the context of wider regional planning exercises (see also TEEBcase Ecosystem Services for PA network planning, Solomon Islands).

### Box 7.12 Hazard protection in Switzerland: Using an ecosystem services assessment for conservation planning

For 150 years, a proportion of Swiss forests have been managed to control avalanches, landslides and rock-falls, especially in the Alps (Brändli and Gerold 2001). Some 17% of Swiss forests are managed for hazard protection, usually on a local scale. Support for these measures, and help in identifying specific locations, is strengthened by calculations projecting that these ‘protection forests’ provide services estimated at US\$ 2-3.5 billion annually (ISDR 2004).



While conservation priorities are necessarily high in areas where unique biodiversity is under threat, some level of compromise in less-threatened areas can

dramatically benefit people's quality of life and their local development outlook. (See also Chapter 6 on spatial planning tools).

### Box 7.13 Protected area zoning in the Mbaracayu Biosphere Reserve, Paraguay



This reserve, once 90% forest, is now highly fragmented. It supports large-scale cattle ranching and soybean production as well as small-scale farming, hunting and foraging by indigenous Ache people. When looking for solutions for this fragmentation, policy makers mapped cost and benefits and concluded that linking two large forest patches with one wildlife corridor would provide more net benefits than two alternative corridor options.



The study identified and assessed five ecosystem services provided by the Mbaracayu Biosphere Reserve in order to determine those areas where the benefits from restricting access would outweigh the costs of foregone benefits from not extracting resources. These were: Sustainable bushmeat harvest, sustainable timber harvest, pharmaceutical bioprospecting, existence value (→*intrinsic value* of unspoiled wilderness), carbon storage.



To calculate conservation benefits in different parts of the reserve, the study determined two things: (i) Who would benefit; (ii) The value of each ecosystem service – per forest parcel, across six forest types.



#### How ecosystem services were calculated:

- Bushmeat is not traded so it has no market price. Its value was estimated by multiplying the local price of store-bought beef (US\$ 1.44/kg) by expected bushmeat production for each forest hectare, from 12 wild game species.
- Market prices of sixteen economically important tree species in the reserve were used to estimate an average value of marketable timber (US\$ 6.87/tree) – this was combined with a sustainable harvest rate of four trees per forest hectare).
- The bioprospecting value was calculated based on literature on drug companies' willingness to pay for potentially marketable drugs derived from endemic forest species.
- Existence value was conservatively estimated at US\$ 5/hectare, based literature on the willingness to pay for tropical forest preservation.
- Carbon storage value was calculated based on estimates of biomass per forest parcel and a conservative CO<sub>2</sub> emissions-trading market price of US\$ 2.50.

#### Localizing costs and benefits allowed for interesting insights:

- Costs and benefits of forest conservation varied considerably across a relatively small landscape, implying that some zoning options would pursue conservation at far lower costs than others.
- When only bioprospecting, bushmeat, timber were included in the analyses, few parcels passed the cost-benefit test for conservation.
- When carbon values were added (the highest value service/ha), benefits exceeded →*opportunity costs* for 98% of the forests.

Certainly these results have to be considered with care – some costs have not been calculated (conservation management costs, for example) and opportunity costs are based on assumptions about future development of the region which is difficult to anticipate. However, what the study demonstrates is that a cost-benefit map is a highly useful tool for discussing options with stakeholders and authorities.

Source: adapted from Naidoo and Ricketts 2006; Gross 2006

## ADDRESSING CONSERVATION CONFLICTS

**Protected areas can both solve conflicts and create conflicts.** Local communities and indigenous peoples are increasingly calling for new protected areas to address what they perceive as threats to traditional lands and water from extractive industries and conversion. ‘Peace parks’ are now a recognized way of addressing cross-border conflicts and tensions. Conversely, PAs can themselves cause conflicts, particularly over access and resources.

Evaluation of ecosystem services can make a case for or against a PA to the people who have to legislate or pay for it, and who have to answer to their local communities. Experience shows that the most acute and intractable conflicts around PAs come when an outside power imposes management on people who are already living there. If costs and benefits are discussed openly so people can see exactly what they will gain and lose, there is far more basis for sound negotiation.

**A proper understanding of what ecosystem services are available from a PA and who has access to them can therefore be a valuable tool in addressing conflicts both inside and outside the PA.**

Regulation and management decisions can alter the availability of ecosystem services with consequences for people, often through loss of access to what had hitherto been free resources such as fuelwood and food. Such consequences are not captured by broad social *→indicators*, like ‘income per capita’. **Poor people often suffer most from restricted access to a PA** because they rely on natural resources for survival. If new livelihood opportunities are not created, restrictive regulations are not only socially unjust, but often ecologically ineffective, because people may be forced to pursue their former practices illegally (see box 7.14). An ecosystem services assessment can make all the costs and benefits visible and thus assist in both the negotiation process to determine just and workable regulations and, if necessary, the creation of fair compensation mechanisms. For example in Moyabamba, Peru, inhabitants

of a municipal PA are paid for restricting their activities in the watershed (TEEBcase Compensation scheme for upstream farmers in a municipal PA, Peru).

One way of addressing *→trade-offs* between different users is through compensation payments although this option is not always available. Compensation might be a fairly minimum value to encourage adherence to a restriction (like not collecting firewood) or a more substantial sum reflecting the full value of a PA’s benefits to society. Those offering payments usually shape the terms of compensation. For this reason, **a monetized ecosystem services model is useful to policy makers; it can be a tool for addressing unequal distribution of costs and benefits in communities.** However, the monetary value of ecosystem services is not the only negotiation tool. **Rights also play a key role** and protected area managers are increasingly negotiating rights to *→sustainable use* of various natural resources within protected areas with local communities.

Ecosystem services *→valuation* can also be a **helpful tool in combating corruption.** In countries with weak governance and high levels of corruption, attempts to use PAs to strengthen local communities and reduce inequality are often blocked by the interests of a rich, powerful minority. By placing a value on ecosystem services, everyone can know exactly what values are being provided and to whom. While transparency about the distribution of costs and benefits cannot solve corruption-related problems, it can make law-breaking more difficult to cover up.

## BUILDING ALLIANCES

Understanding and emphasising the importance of the ecosystem services of a natural ecosystem can **help create management partnerships in a PA**, either due to direct self-interest or because stakeholders become convinced of the area’s wider, inherent values.

Importantly, **PAs are seldom an exclusively local issue** – national agencies, scientists and conservationists from around the world have an interest in, and feel entitled to, involvement in conservation management. While each has their own agenda, dynamics and resources, these actors can be powerful allies.

**Box 7.14 Who benefits from Giant Panda tourism in Wolong?**

Wolong Biosphere Reserve, one of China's most famous PAs, is home to the giant panda. In 2008, there were more than 4,500 people living inside the reserve, most of them farmers. Their activities (logging for fuelwood, agriculture, plant-collection, ranching) have significantly degraded and fragmented panda habitat within the reserve. Since 2002, →*ecotourism* has been promoted in Wolong as a source for financing conservation and additional income for park inhabitants.

A study of stakeholders (restaurant staff, souvenir-sellers, infrastructure/construction workers) revealed that those outside the park had the largest share in tourism-related income. What was significant were the differences between groups of farmers living inside the PA. Those living close to roads had a larger share in tourism-related income, while those living in the panda habitat of the forest had no access to the market of tourism related services and products and therefore had to continue to rely on agriculture for their livelihoods.

In order to protect the Giant Panda, it would make sense for park policy making to involve those farmers who, for want of alternatives, continue to threaten panda habitat.

*Source: adapted from He et al. 2008*

**RAISING FUNDS FOR CONSERVATION**

Accurate and comprehensive assessments can help to identify and generate the funding necessary for effective management of PAs in the following ways:

- Attracting donor funding
- Payment for environmental services
- Bioprospecting
- Carbon sales
- Wildlife viewing and wilderness experience sales

**Attracting donor funding:** Many donor countries and

agencies link aid funding, even for environmental issues, with →*poverty* alleviation. Most agencies broadly interpret 'poverty' to include, beyond monetary value, physical health and general well-being, factors which the ecosystem services model also consider. However, demonstrating the economic benefits of a project is often a major factor in attracting funding. For example, the World Bank and the UN Global Environment Facility both require annual assessments of management effectiveness from the PAs they support. A clearly outlined report on ecosystem service flows can make a strong argument for the essential nature of their support and

**Box 7.15 Management of Kaya forests in Kenya: Positive alliances**

In Kenya, coastal Kaya forests are under severe pressure from exploitation and conversion. They are sacred sites for local people and of interest to conservationists, who value them as irreplaceable relics of a once-extensive East African coastal forest.

Both socio-economic and valuation studies demonstrated the dependence of local communities on the forests for fuelwood, food, medicinal herbs and building materials. These studies also revealed the unsustainable nature of this exploitation. Local communities approached the National Museum of Kenya for management and conservation assistance, in hopes that they might develop sustainable utilization of the forests' resources (Mhando Nyangila 2006).

As a result, new sources of revenue were created. The Kaya Kinondo Ecotourism Project uses local guides to take visitors through the forests. In 2001 communities around Arabuko Sokoke Forest earned US\$ 37,000 from guiding, beekeeping and butterfly farming (Gachanja and Kanyanya 2004).



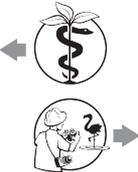
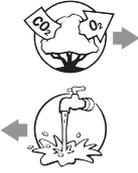
for new or continued funding.

**Payment for environmental services:** Evaluating benefits can attract funds from those using the PA's ecosystem services. For example, Coca Cola outside Bogotá in Colombia pays a fee to maintain natural páramo vegetation in Chingaza National Park above its bottling factory because of the clean water it provides. Similarly, in Ecuador, Quito's water supply company pays residents in two national parks to maintain the forest cover in order maintain water purity and reduce treatment costs (Pagiola et al. 2002; Postel and Thompson 2005). These schemes are often coordinated by local authorities (see Chapter 8).

**Bioprospecting:** Increasingly, PAs are selling the rights to benefits from biodiversity, such as potential pharmaceutical products. In Costa Rica, the National Institute for Biodiversity (INBio) has signed agreements with 19 industry bodies and 18 academic institutions to prospect in PAs in return for biodiversity conservation funding. In the United States, the bacterium *Thermus aquaticus*, collected from a hot spring in Yellowstone National Park, is useful in clinical testing, forensics, cancer research and in helping to detect the virus causing AIDS. Despite the major profits eventually gained by the health industry from developments linked to the use of this bacterium, it did not initially result in any direct benefits for the National Park Service and took substantial lobbying to secure any payments (Stolton and Dudley 2009).

**Carbon sales:** As the carbon economy continues to expand, both voluntary and official offset schemes are considering PAs as delivery mechanisms. Forest PAs are often linked with possible REDD schemes (although these schemes are still being developed). Calculations need to be precise, particularly with respect to sequestration potential and measurement, but there is potential for substantial funding. For example, research by consultants working for The Nature Conservancy calculated that PAs in Bolivia, Mexico and Venezuela contain around 25 million ha of forest, storing over 4 billion tonnes of carbon, estimated to be worth US\$ 39 and US\$ 87 billion in terms of global damage costs avoided (Emerton and Pabon-Zamora 2009).

**Wildlife viewing and wilderness experience sales:** Some PAs have the opportunity to charge visitors. Serengeti National Park in Tanzania earns several million dollars a year and fees charged for mountain gorilla viewing trips at Bwindi Impenetrable Forest National Park in Uganda generate the majority of funds to support the Uganda Wildlife Authority. Funds can also be generated from private or charitable-owned PAs. In the Lupande Game Management Area, adjacent to the South Luangwa National Park (Zambia), two hunting concessions earn annual revenues of US\$ 230,000 for the 50,000 residents, distributed both in cash to the local community and to village projects such as schools (Child and Dalal-Clayton 2004).



#### Box 7.16 Raising park entrance fees in Komodo National Park, Indonesia

Komodo, home to the Komodo dragon, attracts a large number of foreign and national visitors.

A study assessed people's willingness to pay higher entrance fees (in 1996 < US\$ 1). Over 500 visitors were asked whether they would still come if entrance fees were increased to US\$ 4, \$ 8, \$ 16 or \$ 32. The study showed that income could be maximized if visitors fees were set at around US\$ 13. However, the increase in fees would reduce visitor numbers. These 'lost' visitors would not spend on tourism-related services such as accommodation and tour guides, so gains in entrance fees would be offset by losses for the local economy.

Taking these regional economic effects into account, the study suggested that a moderate increase to around US\$ 5 would be a good strategy for increasing park income without losing a significant number of tourists. Further, having a differentiated pricing strategy (charging foreign visitors more than national visitors), and providing clear information on how entrance fees are being utilised seem to increase park income and acceptance of higher fees.

Source: adapted from Walpole et al. 2001

## 7.4 ACTION POINTS

Economic assessments of PAs can secure urgently required political backing for conservation. But valuation is not a panacea. Some important values that these areas protect are difficult to capture through economic analysis, including existence rights of species, sacred values of particular places to faith groups or the health and recreational values of living inside or near a healthy natural landscape.

Using the broader ecosystem services perspective – (see Chapter 10) is a powerful approach to inform management planning, to bring different motivations for conservation to the same table and also to shed light on who carries which burdens in consequence of access restrictions.

As initial action points for local governments and PA authorities we suggest:

- Check the natural and social linkages between your PAs and the surrounding landscapes.
- Appraise the local flow of ecosystem services from the PA to the inhabitants of your municipality. Identify your greatest local needs in relation to the PAs. Search for hidden or as yet unrecognized and underdeveloped opportunities which the PAs present to your municipality.
- Assess the desirability and options for being more closely involved in PA management, possibly through some form of co-management.
- Actively communicate the ecosystem services flows from your PA to close and to distant beneficiaries. This will enhance political backing, build alliances and secure funding.
- Identify the beneficiaries of ecosystem services as well as who carries the costs, as a first step to tackle conservation-related conflicts.

## FOR FURTHER INFORMATION

Borrini-Feyerabend, G., M. Pimbert, M. T. Farvar, A. Kothari and Y. Renard (2004) “Sharing Power: Learning by doing in co-management of natural resources throughout the world”. IIED and IUCN/ CEESP/ CMWG, Cenesta, Teheran. URL: [www.iucn.org/about/union/commissions/ceesp/ceesp\\_publications/sharing\\_power.cfm](http://www.iucn.org/about/union/commissions/ceesp/ceesp_publications/sharing_power.cfm). Huge guide, with many case studies, about participatory approaches to co-management approaches in natural resource management.

Dudley, N. and S. Stolton (2009) “The Protected Area Benefits Assessment Tool: A methodology”. WWF International, Gland, Switzerland. URL: [assets.panda.org/downloads/pa\\_bat\\_final\\_english.pdf](http://assets.panda.org/downloads/pa_bat_final_english.pdf). Rapid questionnaire assessment method for collecting information on the wider benefits of protected areas.

Hockings, M., S. Stolton, F. Leverington, N. Dudley and J. Courrau (2006) “Evaluating Effectiveness: A framework for assessing the management effectiveness of protected areas”. IUCN, Gland, Switzerland. URL: [data.iucn.org/dbtw-wpd/edocs/PAG-014.pdf](http://data.iucn.org/dbtw-wpd/edocs/PAG-014.pdf). Technical guide to assessment of management effectiveness, outlining a general approach and giving examples of several existing systems.

Lockwood, M., G. Worboys and A. Kothari (2006) “Managing Protected Areas: A global guide.” Earthscan, London. Major guide to all aspects of protected area management arising from workshops at the the 2003 World Parks Congress.

Pabon-Zamora, L., J. Bezaury, F. Leon, L. Gill, S. Stolton, A. Grover, S. Mitchell and N. Dudley (2008) “Nature’s Value: Assessing protected area benefits”. Quick Guide Series ed. J. Ervin. The Nature Conservancy, Arlington VA, USA. URL: [www.nature.org/initiatives/protectedareas/files/nature\\_s\\_value\\_assessing\\_protected\\_area\\_benefits\\_english.pdf](http://www.nature.org/initiatives/protectedareas/files/nature_s_value_assessing_protected_area_benefits_english.pdf). Simple, practical guide to the assessment of potential economic benefits from protected areas with three country case studies.

The LAB Guide Book: A Practical Guide to Local Government Biodiversity Management by ICLEI, IUCN and SCBD (forthcoming) URL: [www.iclei.org/index.php?id=10019](http://www.iclei.org/index.php?id=10019). The guide provides advice for planning and managing local biodiversity drawing on the experiences of 21 local authorities. It covers the topics biodiversity and climate change, mainstreaming and managing biodiversity, legislative frameworks and implementation mechanisms.